

Aerobot Sampling and Handling System, Phase I

Completed Technology Project (2006 - 2006)



Project Introduction

Honeybee Robotics proposes to: ?Derive and document the functional and technical requirements for Aerobot surface sampling and sample handling across a range of aerial platforms, mission applications and exploration targets, like Mars and Titan. ?Create a preliminary design for a tether or boom deployed, reusable, low mass & volume surface and subsurface sample acquisition and handling system that can acquire ice and icy regolith samples and perform automated sample transfer. We will focus on designs relevant to environments and sample types on Mars and Titan. ?Demonstrate proof-of-concept, subsystem-level hardware that can acquire a subsurface ice or icy regolith sample deployed from a platform capable of simulating the horizontal and vertical motion of an Aerobot vehicle. The proposed innovations primary significance would be to: ?Provide mission planners with the performance specifications, necessary accommodations, concept of operations and the functional requirement information needed to develop new concepts and exploration applications for Aerobot platforms that have sampling and handling capabilities. ?Identify and address the critical challenges surrounding tether or boom deployed, very low-preload sampling systems targeted toward consolidated materials (e.g. ice or rock). ?Test and characterize the effectiveness of a variety of sample methods, relevant to Aerobot platforms, to acquire ice cores, chips, icy regolith and even liquid samples with integrity and volatiles retained. ?Demonstrate sampling at a safe distance and in a safe manner from the aerial platform. ?Demonstrate, with analysis and hardware, the basic feasibility of an Aerobot sampling and handling system. ?Provide requirement information and test data about an existing system, Honeybee's Touch and Go Sample System (TGSS), capability to acquire ice, icy regolith and even liquid samples from a platform with both horizontal and vertical motion during sampling operations.



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Organizational Responsibility

Responsible Mission Directorate:

Space Technology Mission Directorate (STMD)

Lead Center / Facility:

Jet Propulsion Laboratory (JPL)

Responsible Program:

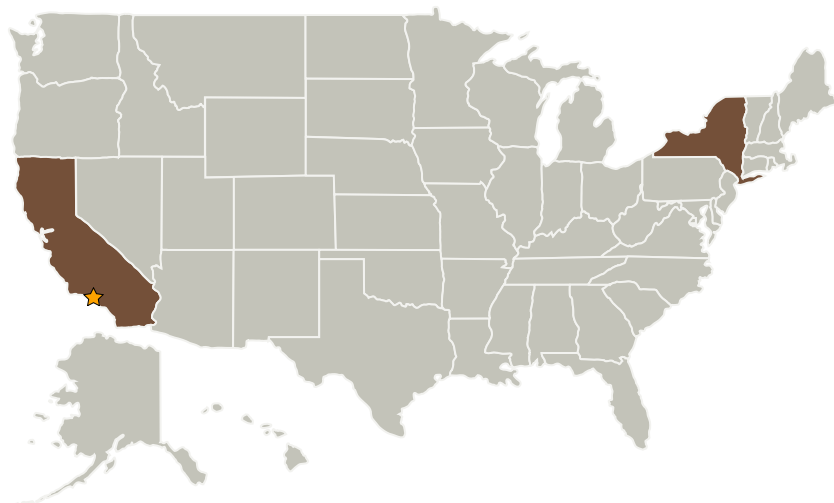
Small Business Innovation Research/Small Business Tech Transfer

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Primary U.S. Work Locations and Key Partners



Project Management

Program Director:

Jason L Kessler

Program Manager:

Carlos Torrez

Technology Areas

Primary:

- TX04 Robotic Systems
 - └ TX04.3 Manipulation
 - └ TX04.3.4 Sample Acquisition and Handling

Organizations Performing Work	Role	Type	Location
★ Jet Propulsion Laboratory (JPL)	Lead Organization	NASA Center	Pasadena, California
Honeybee Robotics, Ltd.	Supporting Organization	Industry	Pasadena, California

Primary U.S. Work Locations

California	New York
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